

Biodiversity, connectivity, and ecological forecasting:

Applying NASA earth observation data to conservation management in the Greater Kruger National Park region, South Africa

Jody Vogeler (co-PI) ¹, David Bunn (co-PI) ², Derek Fedak ¹, Steve Filippelli ¹, Neil Carter ³, Sharon Hall ⁴, Melissa McHale ²

1



2



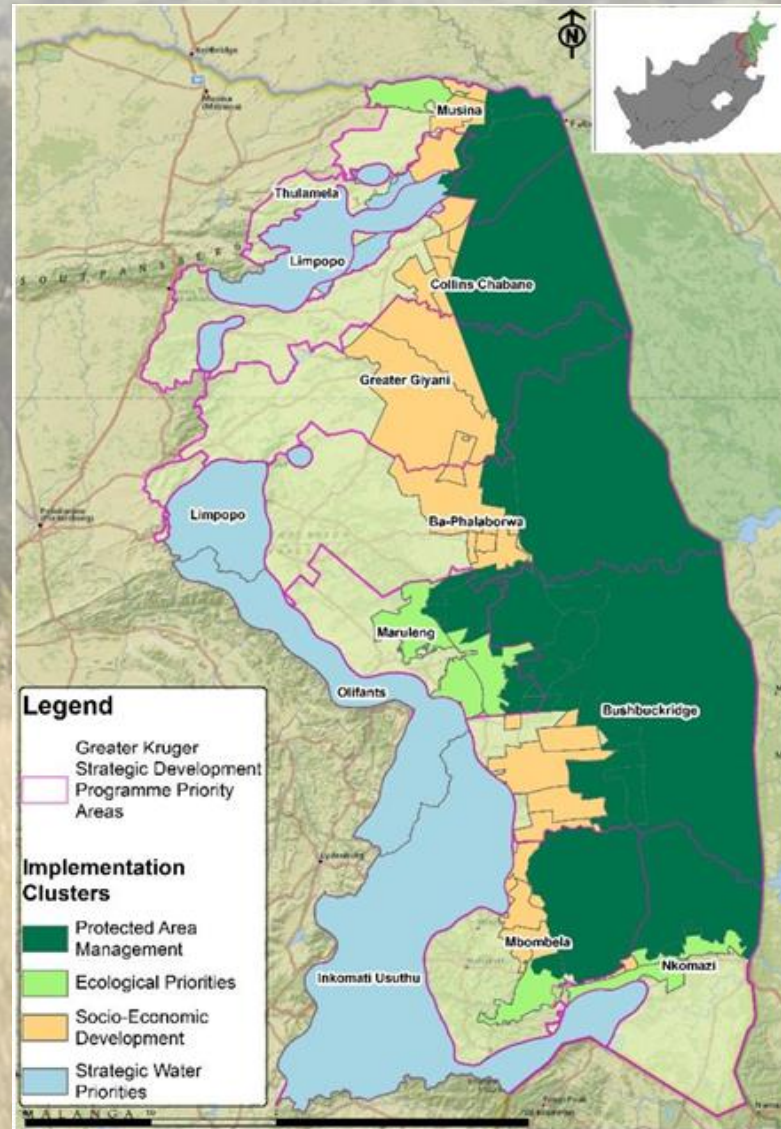
3



4

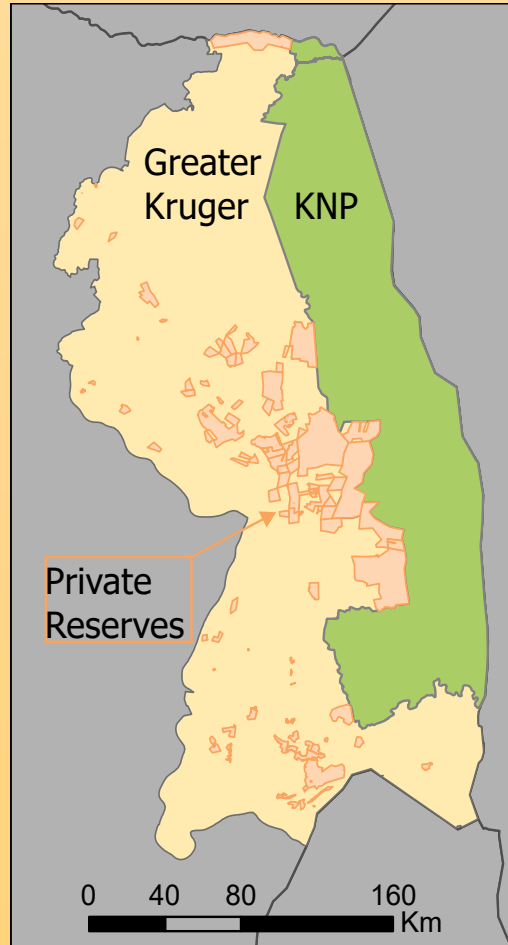


Greater Kruger National Park Region (GKNP)



GKNP – Rewilding

Fence removals



Artificial water source closures

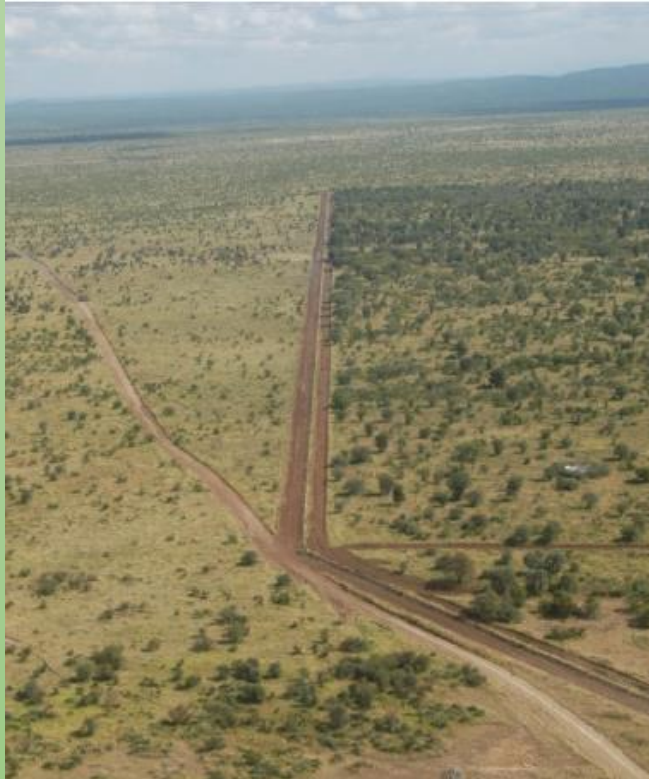


Fire Management



GKNP – Identify end-user priorities

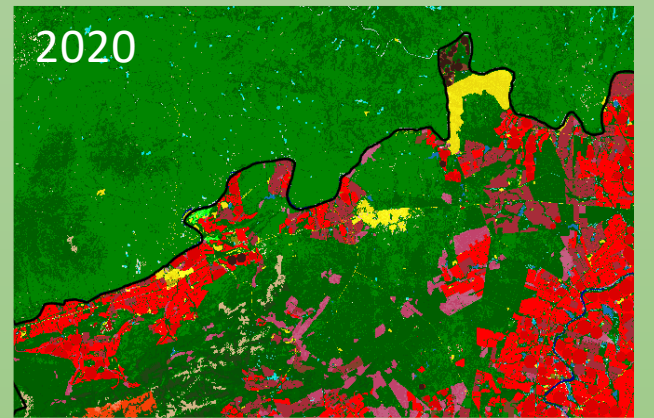
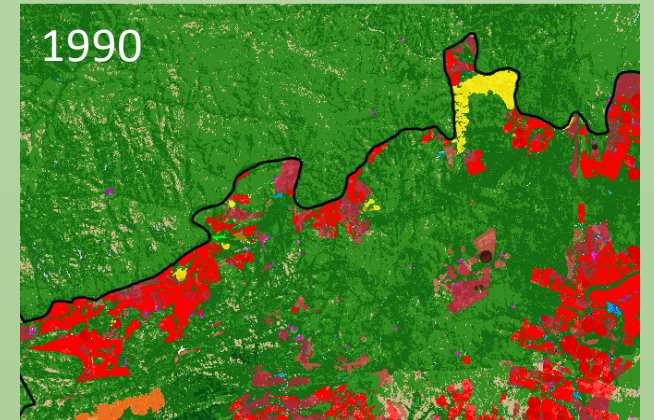
Map vegetation changes



Predict habitat & connectivity for focal species

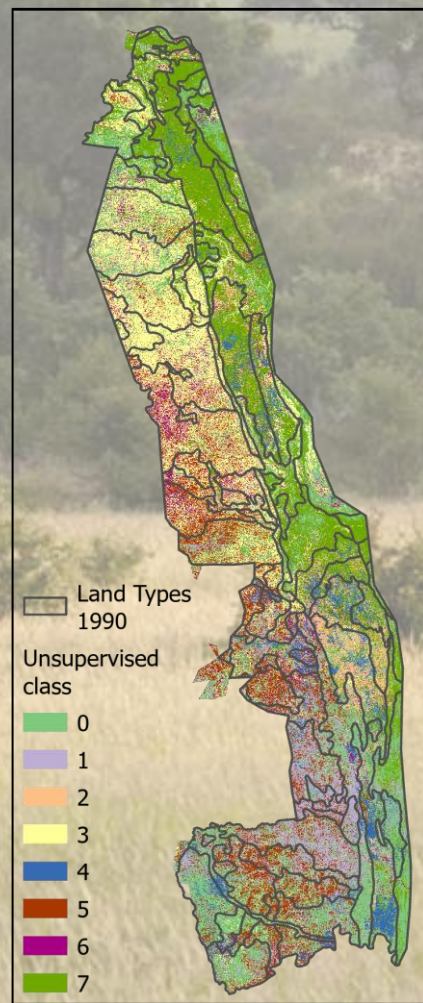


Identify change drivers and trends

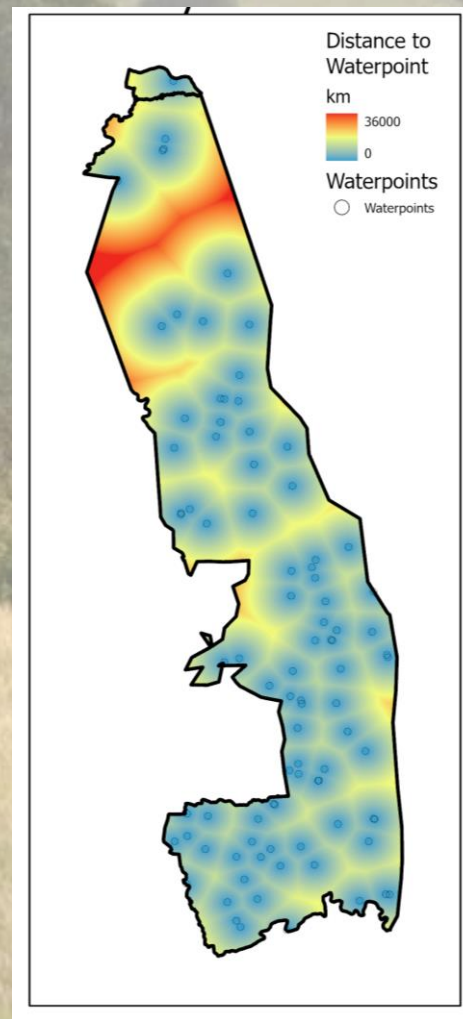


GKNP – Project Building Blocks

Vegetation Products



Surface Water

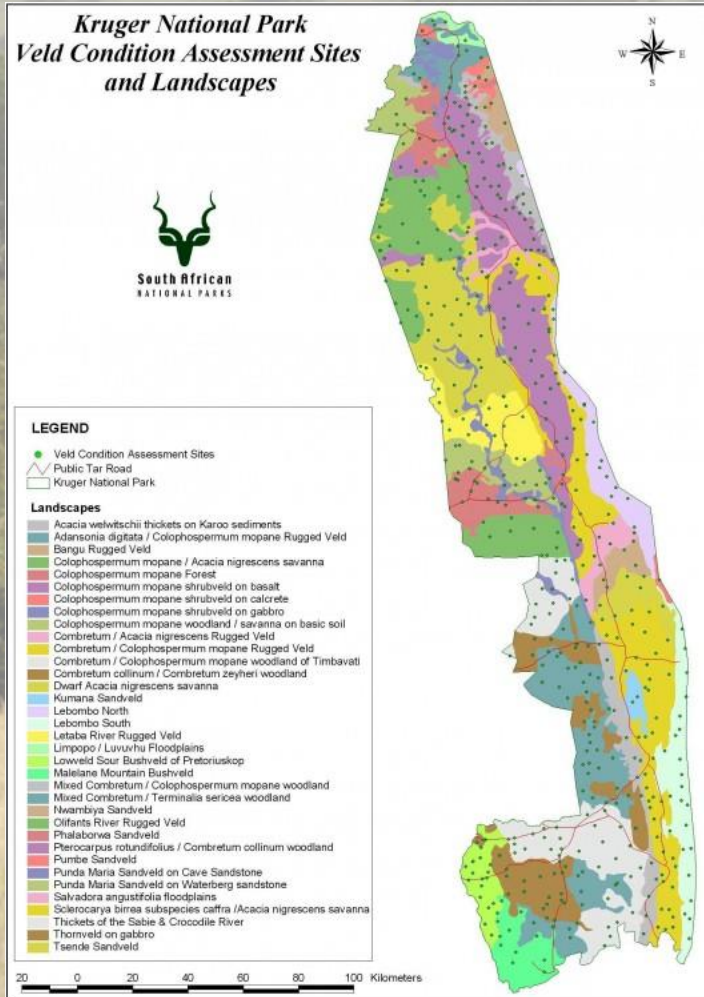


Urbanization Patterns



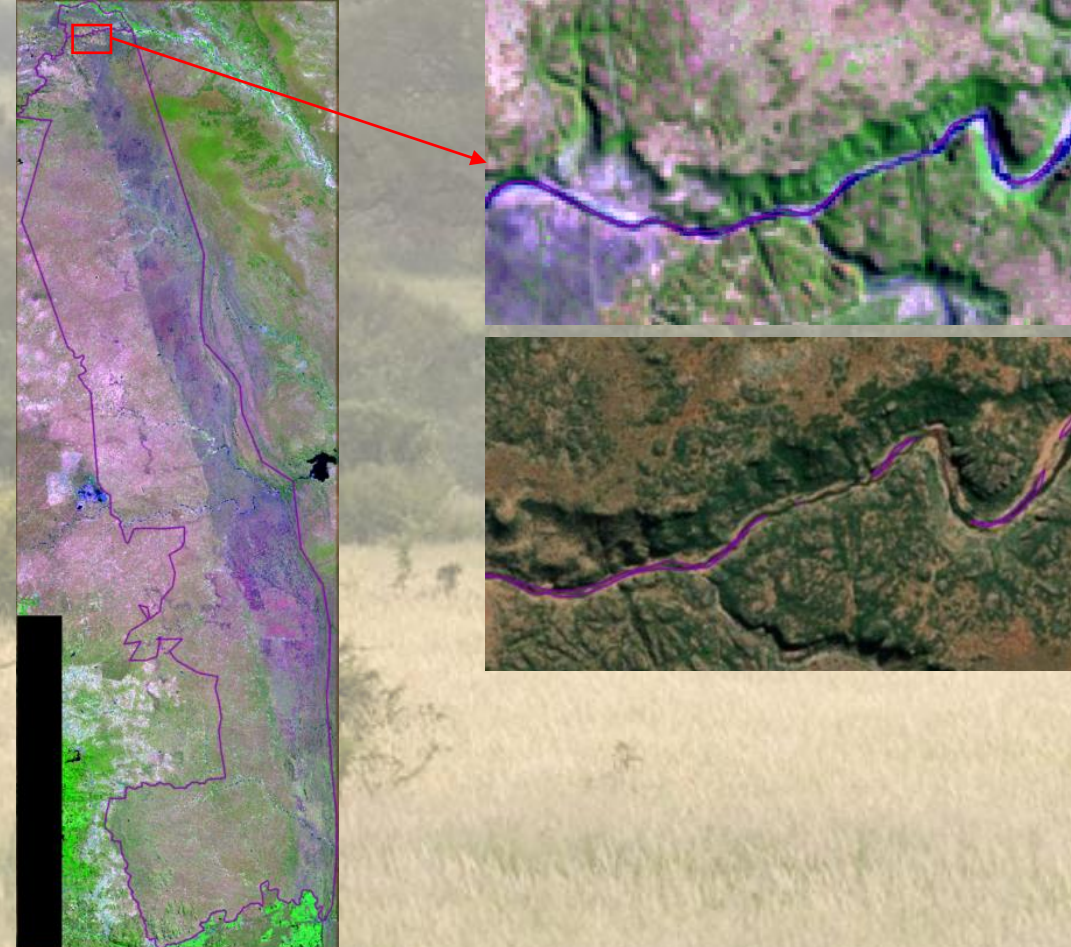
GKNP – Vegetation Dynamics

Broad vegetation type delineation



Venter 1990 Landscapes

Remote sensing captures finer scale spatial variation



GKNP – Vegetation Dynamics

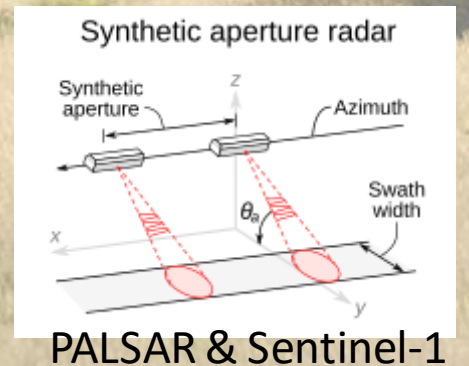
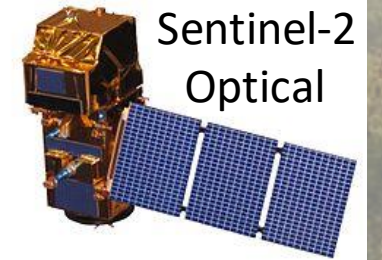
Reference sources

Past Veg
Surveys



Our veg
surveys of
recent
conditions

Remote sensing predictors



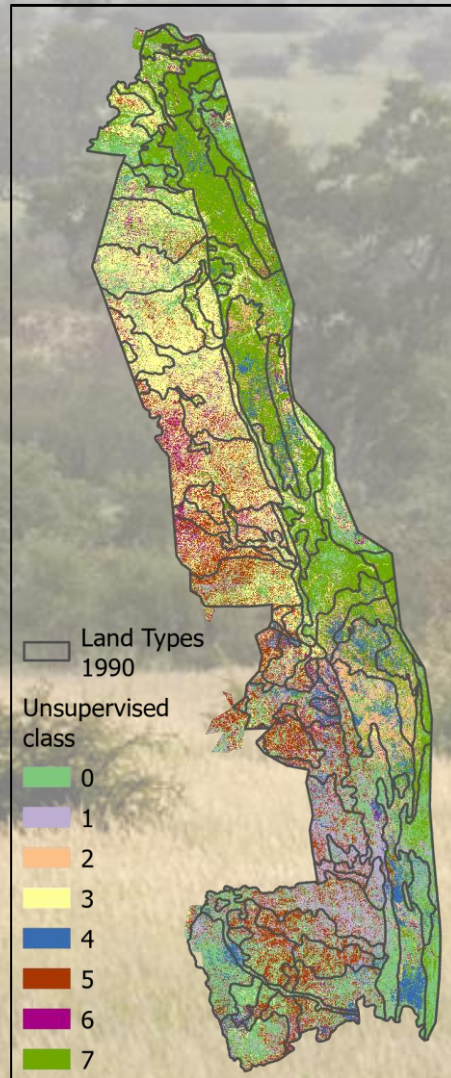
GKNP – Vegetation Dynamics

Reference sources

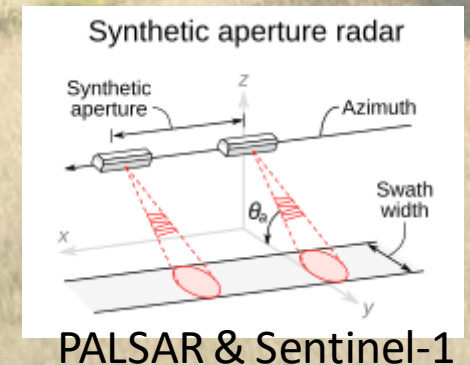
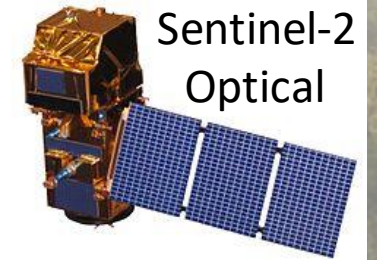
Past Veg
Surveys



Our veg
surveys of
recent
conditions



Remote sensing predictors



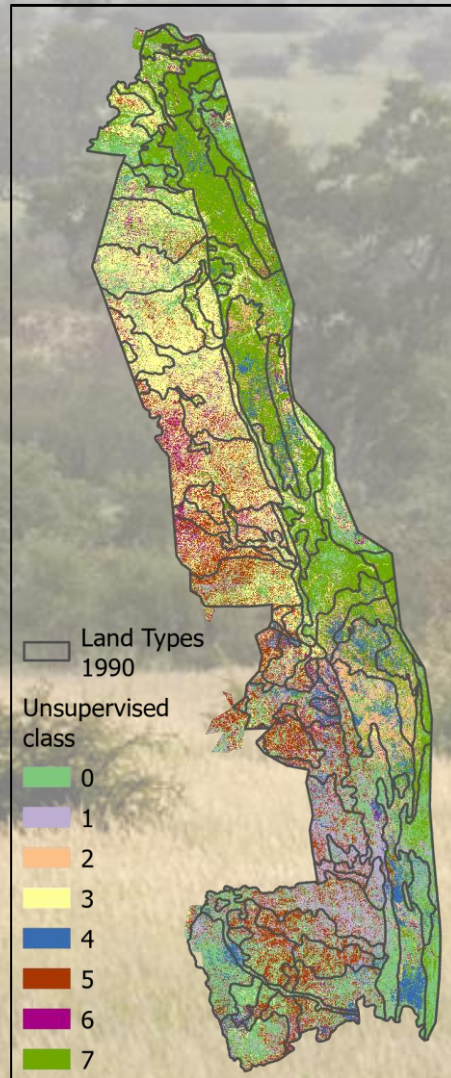
GKNP – Vegetation Dynamics

Reference sources

Past Veg
Surveys



Our veg
surveys of
recent
conditions



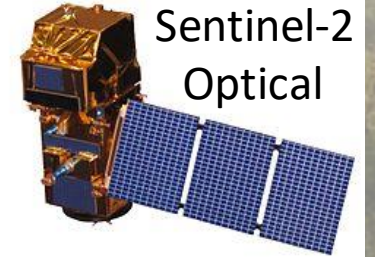
RH98 (m)



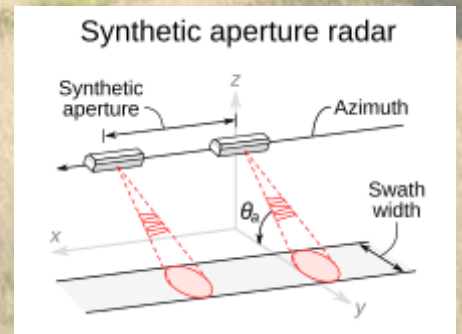
Remote sensing predictors



Landsat
Optical

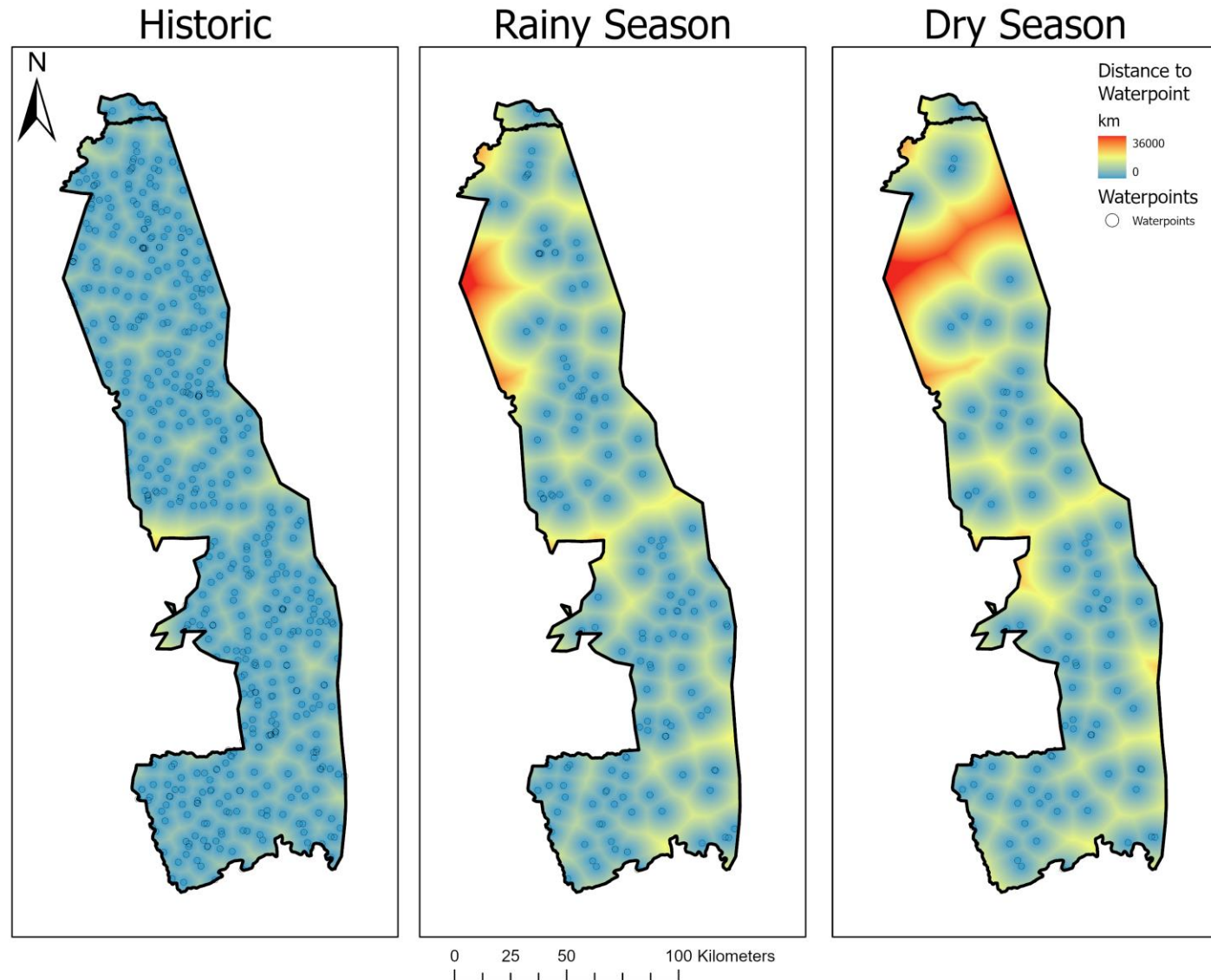


Sentinel-2
Optical



PALSAR & Sentinel-1

GKNP – Waterhole Management



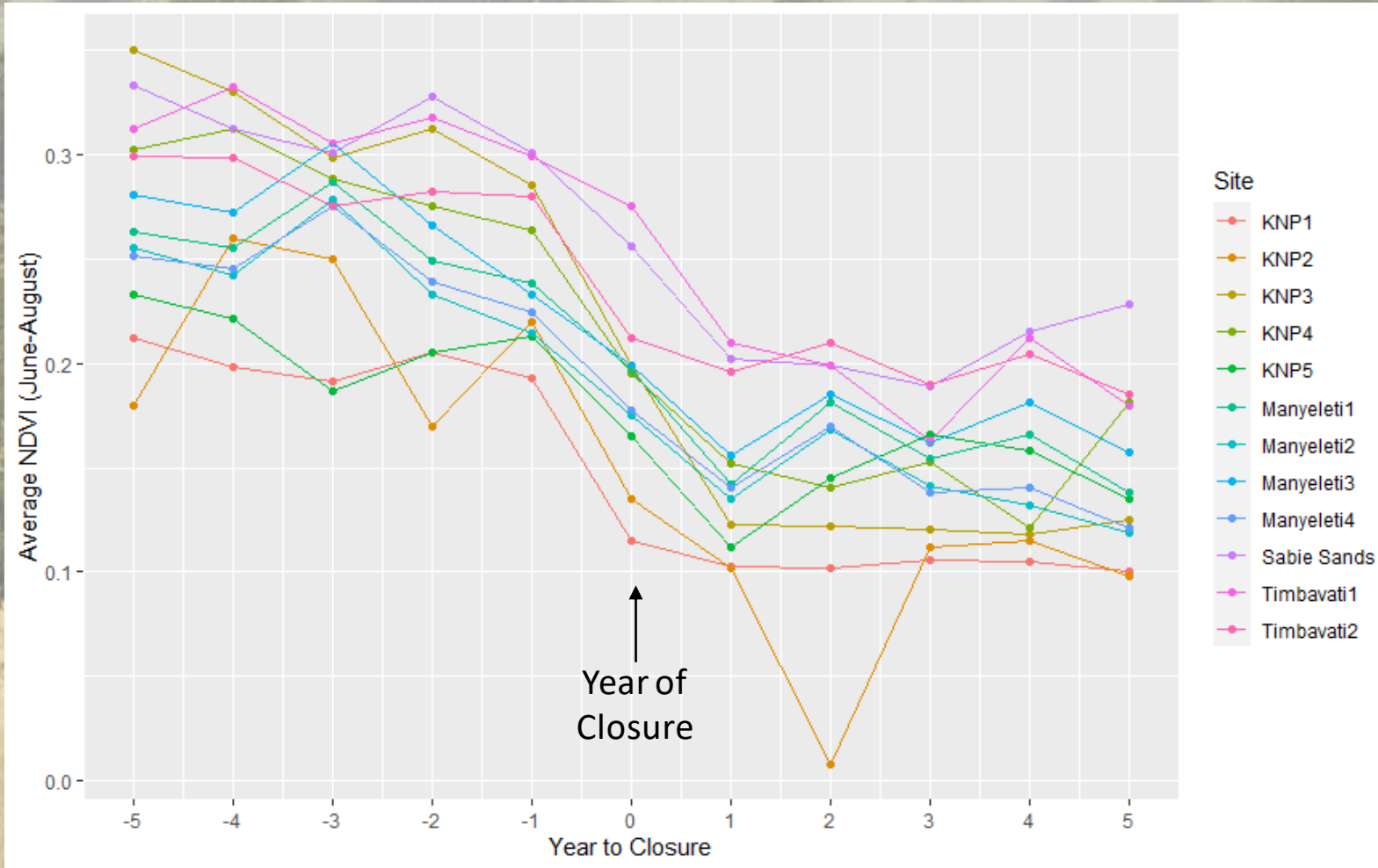
Artificial Bore Holes



Dammed Water Holes



GKNP – Waterhole Management



Artificial Bore Holes



Dammed Water Holes



GKNP – Urbanization Pressures

2021-2022 Undergrad Student Projects

Monitoring Sustainable Development Goal Indicator 11.3.1 for Expanding Urban Areas in South Africa



Cody Bingham, Jody Vogeler

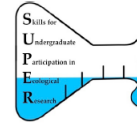


Skills for
Undergraduate
Participation in
Ecological
Research

Proximity of Urban Expansions Near Protected Areas In South Africa

Owen Joyce, Jody Vogeler

Department of Ecosystem Science and Sustainability



Skills for
Undergraduate
Participation in
Ecological
Research

The interactions between LCLU changes and NFEPA rivers

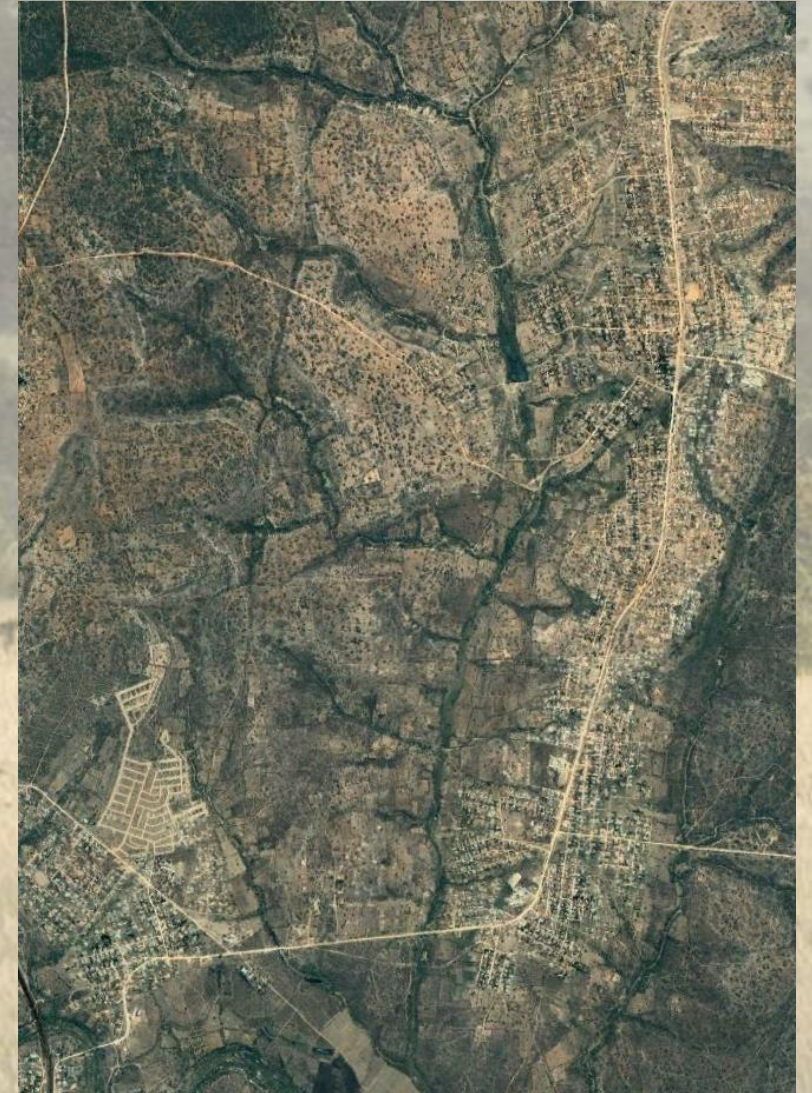
Keana Shadwell¹, Jody Vogeler, PhD.²

¹ Ecosystem Science and Sustainability Department, Colorado State University

² Natural Resources Ecology Laboratory, Colorado State University



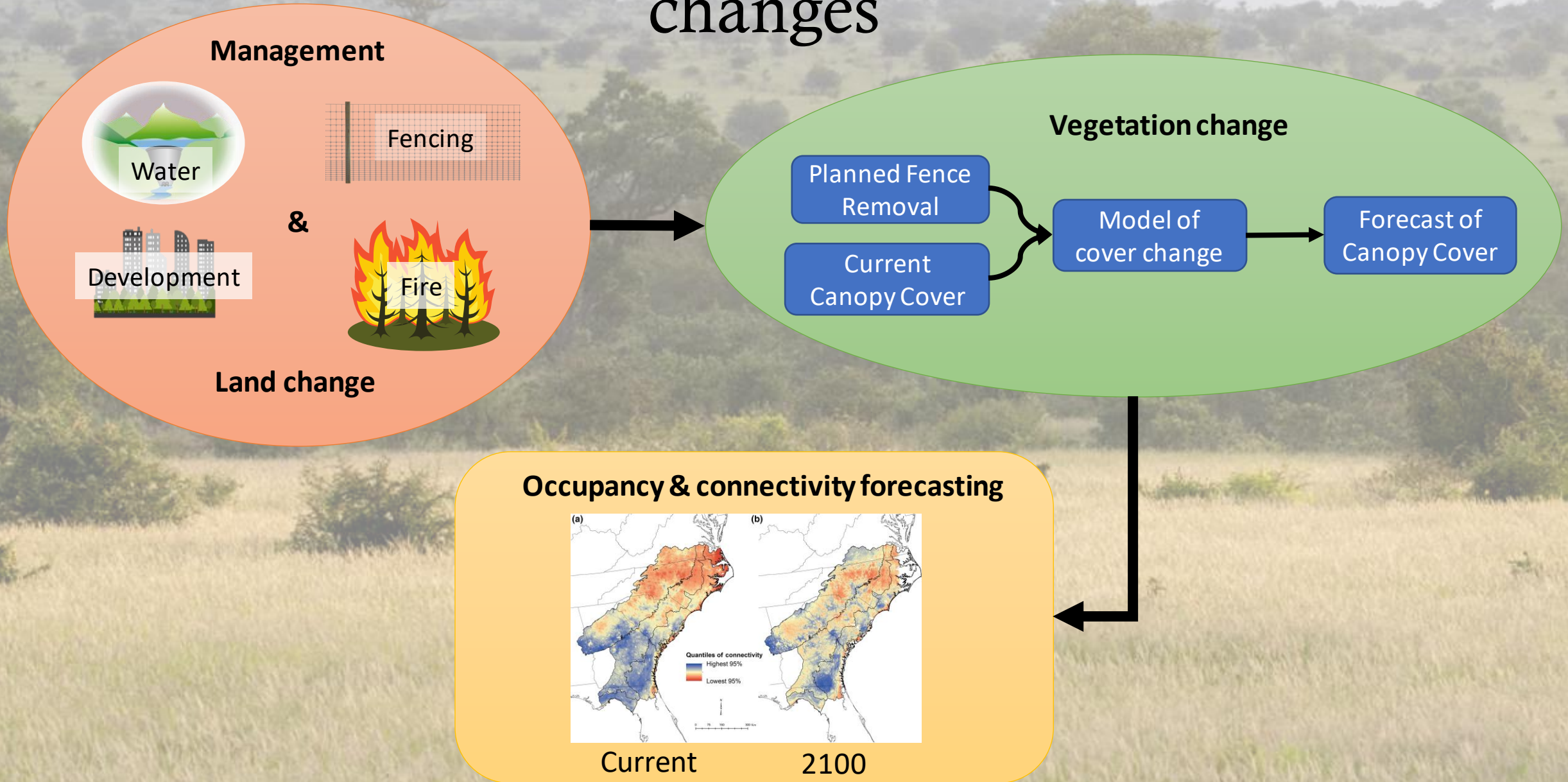
* CSU College
Honors Award –
CURC Symposium



GKNP – Wildlife Habitat Connectivity



GKNP – Forecasting the effects of anticipated changes



A wide-angle photograph of a savanna landscape. The foreground is filled with tall, dry, yellowish-brown grass. Scattered throughout the middle ground are various green trees and shrubs of different sizes. In the background, a line of more trees is visible against a pale, hazy sky. The overall scene is peaceful and natural.

Questions?

Tuesday Poster Session

